

**Thin Mini-ITX SBC supports 14nm Intel® Pentium®/Celeron®  
on-board SoC, 12V DC input, VGA/LVDS/DP+HDMI,  
SATA 6Gb/s, dual GbE, USB 3.0,  
HD Audio and RoHS**

# **tKINO-BW**

## **Quick Installation Guide** **Version 1.0**

Mar 10, 2016.

### **Package List**

tKINO-BW package includes the following items:

- 1 x tKINO-BW single board computer
- 1 x I/O shielding
- 1 x SATA cable
- 1 x One Key Recovery CD
- 1 x QIG
- 1 x Utility CD



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## Specifications

- SoC:
  - Intel® Pentium® N3710 on-board SoC  
(up to 2.56GHz, quad-core, 2MB cache, TDP=6W)
  - Intel® Celeron® N3160 on-board SoC  
(up to 2.24GHz, quad-core, 2MB cache, TDP=6W)
  - Intel® Celeron® N3060 on-board SoC  
(up to 2.48GHz, dual-core, 2MB cache, TDP=6W)
  - Intel® Celeron® N3010 on-board SoC  
(up to 2.24GHz, dual-core, 2MB cache, TDP=4W)
- BIOS: AMI UEFI BIOS
- Memory:
  - Two 204-pin 1333/1600 MHz single-channel DDR3L SDRAM unbuffered SO-DIMM slots
- Graphics Engine:
  - Intel® HD Graphics Gen 8 Engines with 16 low-power execution units, supporting DX11.1, OpenGL 4.2 and OpenCL1.2
- Display Output:
  - Triple independent display
  - 1 x HDMI/DP (up to 3840x2160@30Hz)
  - 1 x 18/24-bit dual-channel LVDS by CH7511B DP to LVDS converter (up to 1920x1200@60Hz)
  - 1 x VGA by CH7517 DP to VGA converter (up to 1920x1200@60Hz)
- Ethernet: Dual Realtek RTL8111E PCIe GbE controller
- External I/O Interfaces:
  - 4 x USB 3.0
- Internal I/O Interfaces:
  - 4 x RS-232 (2x5 pin, P=2.0)
  - 2 x RS-232/422/485 (2x5 pin, P=2.0)
  - 2 x SATA 6Gb/s with 5V output

- 1 x mSATA colay SATA2
- 1 x KB/MS (1x6 pin)
- 2 x USB 2.0 (2x4 pin, P=2.54)
- Front Panel:
  - 1 x Front panel (2x7 pin, power LED, HDD LED, speaker, power button, reset button)
- LAN LED: 2 x LAN LED (1x2 pin)
- SMBus: 1 x SMBus (1x4 pin)
- TPM: 1 x TPM connector (2x10 pin)
- I<sup>2</sup>C: 1 x I<sup>2</sup>C (1x4 pin)
- Digital I/O: 1 x 8-bit digital I/O (2x5 pin)
- Expansion :
  - 1 x Full-size PCIe Mini card slot
  - 1 x microSD card slot
  - 1 x PCIe x1
- Audio:
  - Realtek ALC662 HD codec
  - 1 x Audio jack (line-out)
  - 1 x Analog audio (2x5 pin)
- Watchdog Timer:
  - Software programmable supports 1~255 sec. system reset
- Power supply:
  - 12V only DC input
  - 1 x External DC power jack (ø5.5 mm)
  - 1 x Internal power connector (2x2 pin)
  - Support AT/ATX mode
- Fan Connector:
  - 1 x CPU smart fan (1x4 pin)
  - 1 x System smart fan (1x4 pin)
- Power Consumption:
  - 12V@1.33A (Intel® Celeron® N3060 CPU with 4 GB 1600 MHz DDR3L memory)

- Operating Temperature: -20°C ~ 60°C
- Storage Temperature: -30°C ~ 70°C
- Operation Humidity: 5% ~ 95%, non-condensing
- Weight(GW/ NW): 900g/ 400g

## Ordering Information

- **tKINO-BW-N4-R10:**  
Thin Mini-ITX SBC supports Intel® Pentium® quad-core processor N3710 up to 2.56GHz (6W), 12V DC input, VGA/LVDS/DP+HDMI, SATA, dual GbE, USB 3.0, HD Audio and RoHS
- **tKINO-BW-N3-R10:**  
Thin Mini-ITX SBC supports Intel® Celeron® quad-core processor N3160 up to 2.24GHz (6W), 12V DC input, VGA/LVDS/DP+HDMI, SATA, dual GbE, USB 3.0, HD Audio and RoHS
- **tKINO-BW-N2-R10:**  
Thin Mini-ITX SBC supports Intel® Celeron® dual-core processor N3060 up to 2.48GHz (6W), 12V DC input, VGA/LVDS/DP+HDMI, SATA, dual GbE, USB 3.0, HD Audio and RoHS
- **tKINO-BW-N1-R10:**  
Thin Mini-ITX SBC supports Intel® Celeron® dual-core processor N3010 up to 2.24GHz (6W), 12V DC input, VGA/LVDS/DP+HDMI, SATA, dual GbE, USB 3.0, HD Audio and RoHS

- **32205-002700-100-RS:** RS-232 cable, 200mm, P=2.0
- **32205-003700-100-RS:** RS-232 & RS-422/485 cable, 230mm, P=2.0
- **32205-003800-100-RS:** RS-422/485 cable, 200mm, P=2.0
- **TPM-IN01-R11:**  
20-pin Infineon TPM module, software management tool,  
firmware V3.17

## Jumpers setting and connectors

LABEL	FUNCTION
J_CMOS1	Clear CMOS Switch
SW_A/T1	AT Power Auto BTN Switch
J_PW1	Panel Power setting
SW1	Panel Resolution
SW_H/D1	HDMI/DP Monitor setting
J_AUDIO1	Audio pin Header
J_USB1	Dual USB 2.0 pin Header
SATA_PWR1, SATA_PWR2	SATA HDD Power
SATA1, SATA2	SATA HDD Connector
COM1~4	Internal RS-232 serial port connectors
J_DIO1	Digital I/O Pin Header
TPM1	TPM Pin Header
J_KB/MS1	Keyboard and mouse connector
F_PANEL1	Front panel connector
J_SPI1	BIOS Programmer Connector
INV1	Panel inverter connector
LVDS1	LVDS Connector
BT1	CMOS Battery Header
CPU_FAN1	CPU FAN Connector
SYS_FAN1	System fan connector
J_SMB1	SMBUS Connector

J_I2C1	I2C Connector
J_CS1	Chassie Pin Header
J_EC1	EC Programmer Connector
EC_DBG1	For EC Debug card
PWR2	Power input Connector
PWR1	Power input Connector
DP/HDMI1	External Display port and HDMI Connector
VGA1	External CRT Connector
USB1	External Dual USB3.0 Connector
USB2	External Dual USB3.0 Connector
LAN1	External GIGA LAN Connector
LAN2	External GIGA LAN Connector
SPK1	External Audio OUT Connector
PCIE1	PCIEx1 Connector
SD1	MINI SD Card Connector
DIMM1/DIMM2	DDR3L SODIMM Slot
MINI-PCIE1	Support USB and PCIE Interface
MSATA1	Support USB and m-SATA Interface

#### **J\_CMOS1: Clear CMOS Switch**

<b>PIN NO.</b>	<b>DESCRIPTION</b>
Open	Normal Operation (Default)
Push	Clear CMOS Setup

#### **SW\_AT1: AT Power Auto BTN Switch**

<b>PIN NO.</b>	<b>DESCRIPTION</b>
Short A - B	ATX Mode (default)
Short B - C	AT Mode

#### **J\_PW1: Panel Power setting**

<b>PIN NO.</b>	<b>DESCRIPTION</b>
Short 1 - 2	Keep VCC3V Panel Setup
Short 2 - 3	Keep VCC5V Panel Setup

<b>SW1: Panel Resolution</b>	
* ON=0, OFF=1; Single=S, Dual=D	
<b>4-3-2-1</b>	<b>DESCRIPTION</b>
0000	800x600 18-bit Single (Default)
0001	1024x768 18-bit Single
0010	1024x768 24-bit Single
0011	1280x768 18-bit Single
0100	1280x800 18-bit Single
0101	1280x960 18-bit Single
0110	1280x1024 24-bit Dual
0111	1366x768 18-bit Single
1000	1366x768 24-bit Single
1001	1440x960 24-bit Dual
1010	1400x1050 24-bit Dual
1011	1600x900 24-bit Dual
1100	1680x1050 24-bit Dual
1101	1600x1200 24-bit Dual
1110	1920x1080 24-bit Dual
1111	1920x1200 24-bit Dual

<b>SW_H/D1: HDMI/DP Monitor setting</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
Short A - B	HDMI
Short B - C	Display port (default)

<b>J_AUDIO1: Audio pin Header</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	LINEOUT1R	2	LINEIN-R
3	GND	4	GND
5	LINEOUT1L	6	LINEIN-L
7	GND	8	GND
9	MIC-R	10	MIC-L

<b>J_USB1: Dual USB 2.0 pin Header</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC5V	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	VCC5V

<b>SATA_PWR1/SATA_PWR2: SATA HDD Power</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC12v	2	GND
3	GND	4	VCC5V

<b>SATA1/SATA2: SATA HDD Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	SATA_TXP
3	SATA_TXN	4	GND
5	SATA_RXN	6	SATA_RXP
7	GND		

<b>COM1/COM2/COM3/COM4: RS232 Pin Header</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	DCD	2	DSR
3	RX	4	RTS
5	TX	6	CTS
7	DTR	8	RI
9	GND	10	GND

<b>J_DIO1: Digital I/O Pin Header</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	VCC5V
3	DOUT3	4	DOUT2
5	DOUT1	6	DOUT0
7	DIN3	8	DIN2
9	DIN1	10	DIN0



<b>TPM1: TPM Pin Header</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	CLOCK	2	GND
3	FRAME	4	KEY/NC
5	RESET	6	VCC5V
7	LAD3	8	LAD2
9	VCC3V	10	LAD1
11	LAD0	12	GND
13	SMB_CLK	14	SMB_DATA
15	SB3V	16	SERIRQ
17	GND	18	CLKRUN
19	LPSPD	20	DRQ

<b>J_KB/MS1: Keyboard and mouse connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC5V	2	MSDATA
3	MSCLK	4	KBDATA
5	KBCLOCK	6	GND

<b>F_PANEL1: Front panel connector</b>					
	<b>PIN</b>	<b>DESCRIPTION</b>	<b>PIN</b>	<b>DESCRIPTION</b>	
PWR LED	1	PWR_LED+	2	SPKR+	SPKR
	3	NC	4	NC	
	5	PWR_LED-	6	NC	
PWR BTN	7	PWR_BTN+	8	SPKR-	RESET
	9	PWR_BTN-	10	NC	
HDD LED	11	HDD_LED+	12	RESET+	
	13	HDD_LED-	14	RESET-	

<b>J_SPI1: BIOS Programmer Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC1.8V	2	CS
3	MISO	4	CLK
5	MOSI	6	GND

<b>INV1: Panel inverter connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	LCD_ADJ	2	GND
3	VCC12V	4	GND
5	BL_ON/OFF		

<b>LVDS1: LVDS Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	GND
3	A0P	4	A0M
5	A1P	6	A1M
7	A2P	8	A2M
9	CLK1P	10	CLK1M
11	A3P	12	A3M
13	GND	14	GND
15	A4P	16	A4M
17	A5P	18	A5M
19	A6P	20	A6M
21	CLK2P	22	CLK2,
23	A7P	24	A7M
25	GND	26	GND
27	LCD_VCC	28	LCD_VCC
29	LCD_VCC	30	LCD_VCC

<b>BT1: CMOS Battery Header</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VBAT+	2	GND

<b>CPU_FAN1: CPU FAN Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	VCC12V
3	FANIO	4	PWM

<b>SYS_FAN1: System fan connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	VCC12V
3	FANIO	4	PWM

<b>J_SMB1: SMBUS Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	SMB_DATA
3	SMB_CLK	4	VCC5V

<b>J_I2C1: I2C Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	I2C_DATA
3	I2C_CLK	4	VCC5V

<b>J_CS1: Chassie Pin Header</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC3V	2	CHASSIE

<b>J_EC1: EC Programmer Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC3.3V	2	CS
3	MISO	4	CLK
5	MOSI	6	GND

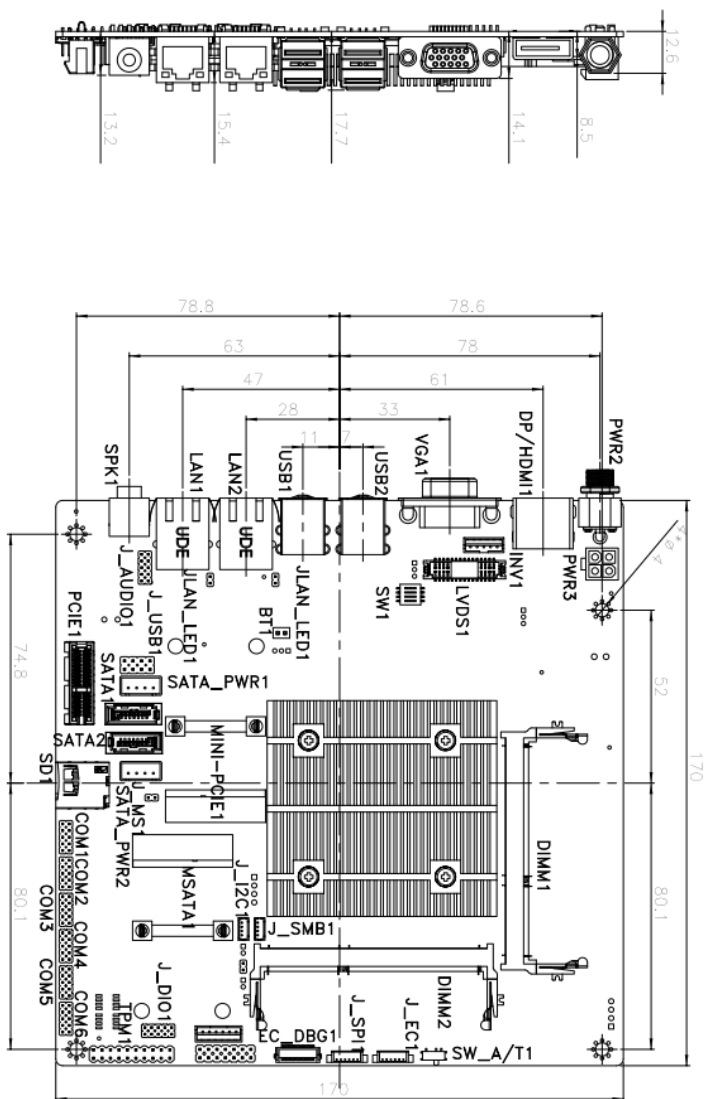
<b>EC_DBG1: For EC Debug card</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	KSI0	2	KSO0
3	KSO1	4	KSO2
5	KSO3	6	KSO4
7	KSO5	8	KSO6
9	KSO7	10	KSO8
11	KSO9	12	KSO10
13	KSO12	14	KSI1
15	KSO11	16	KSI2
17	KSI3	18	GND
19	GND	20	GND

<b>PWR2: Power input Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC12V	2	GND

<b>PWR1: Power input Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC12V	2	GND

<b>COM5/COM6: RS232/422/485 Pin Header</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	DCD/TX-/D-	2	DSR
3	RX/TX+/D+	4	RTS
5	TX/RT+	6	CTS
7	DTR/RX-	8	RI
9	GND	10	GND

# Board Layout: Jumper and Connector Locations



(Unit: mm)